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POULTRY HOUSES *and* FIXTURES

GROWING CHICKS and laying hens need comfortable houses that are dry and roomy, with plenty of fresh air and sunlight. It never pays to overcrowd them.

Detailed information on how to build poultry houses is given in the following pages, so that anyone handy with tools can build them.

Persons intending to build are advised to consult the poultry department of their State agricultural college or State experiment station.

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POULTRY HOUSES AND FIXTURES

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CONTENTS

	Page		Page
Essentials in housing poultry	1	Estimating materials required	21
Location and site	2	Constructing the house	22
Brooder houses	2	Artificial lights	25
Laying houses	7	Artificial heat	26
Capacity of laying houses	8	Insulation of the walls and roof	26
Yards and fences	10	Ventilation	26
Details of design	13	Fixtures and equipment	27
Materials for building	20		

CERTAIN GENERAL PRINCIPLES apply to all poultry-house construction, though local conditions determine to a large extent the exact type which will give best results. Climatic and other conditions vary to such an extent in different parts of the United States that it is impossible to give in this brief treatise a description of the type of house best suited for each locality. This bulletin, therefore, is confined to a discussion of the principles of poultry-house construction. It includes also a plan of a brooder house and one of a laying house.

This type of brooder house, with perhaps slight modifications, should give satisfaction in most parts of the country. The plan of a laying house is suitable for many sections of the country and it serves also to illustrate several principles of house construction.

Plans of houses suitable for conditions in most of the States may be obtained from the State experiment station or State agricultural college.

ESSENTIALS IN HOUSING POULTRY

The first essential in housing chicks or laying hens is comfort, for unless chicks are comfortable they will not grow well and pullets and hens will not lay well. To be comfortable a house must provide plenty of room, be well supplied with fresh air and sunlight, and always be dry.

The second essential is economy. A new house need not be expensive, but it should be durable; the more durable the house the less the cost of housing per year in a period of years. Avoid building cheap, flimsy houses, as they soon have to be replaced.

The third essential is convenience. The house should be conveniently located and should be of such shape and size that work in it can be done with ease. Too often the mistake of building small houses with low roofs is made, so that it is drudgery to care for the chicks or the layers. Since labor is an important factor in the management of poultry, the arrangement of the house for convenience adds greatly to the chances of success.

LOCATION AND SITE

The location should provide good drainage of water and circulation of air, so that the floor and yards will be dry. The house should not be in a low pocket or hollow in which cold air settles. Wherever possible a southern or southeastern exposure should be selected, although this is not so vital if there is good reason for facing the house in some other direction.

Poultry can be raised successfully on any well-drained soil. A light loam which will grow good grass is well adapted for this purpose whereas a lighter, sandy soil through which water leaches freely is best for intensive poultry keeping. A heavy clay or other water-retentive soil is not well adapted to poultry raising, as such land does not drain readily, and therefore makes it much more difficult to keep the stock healthy. Where the soil is of such character the site of the house should be underdrained, and particular care

FIGURE 1.—A partially open-front type of laying house on a good site; the land is well drained, and the trees at the north provide a windbreak.

should be taken to see that the house is situated so that all surface water is drained away from it.

Houses that are protected by trees or other windbreaks (fig. 1) usually give better results than houses which are exposed.

BROODER HOUSES

The houses in which chicks are brooded and reared should be so constructed as to promote the most efficient growth in the chicks. A brooder house should provide ample protection from the weather but should also be well ventilated, because chicks do not do well if brooded in houses where the atmosphere is stuffy. At the same time no direct draft should pass through the house. The brooder house should provide plenty of room for the chicks, allowing at least 100 square feet of floor space for 300 chicks. For farm flocks, in most cases, the house should be easily portable.

COLONY BROODER HOUSES

Portable houses for colony stove brooders may be built in different sizes and styles, but they should be of sufficient size and height to be convenient to work in while tending the brooder or feeding the chicks. The shed-roof brooder house illustrated in figure 2 is used with satisfactory results at the United States Animal Husbandry Experiment Farm, Beltsville, Md.

Detailed plans of this brooder house are given in Figures 3 and 4 supplemented by a list of materials on page 6. This house is 10 by 14 feet and will accommodate from 300 to 400 chicks, but best results are obtained when not more than 300 chicks are kept in one flock. The house is built on runners to facilitate moving and is as

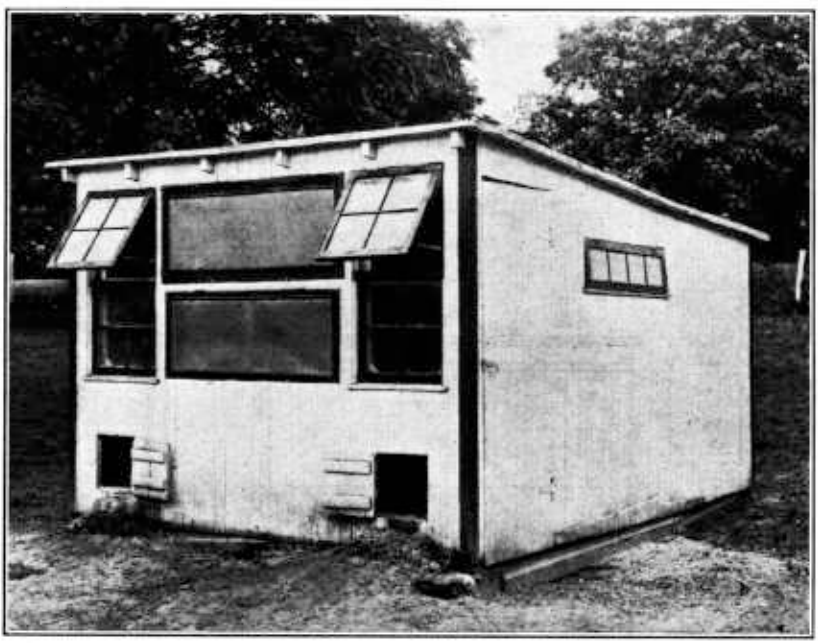
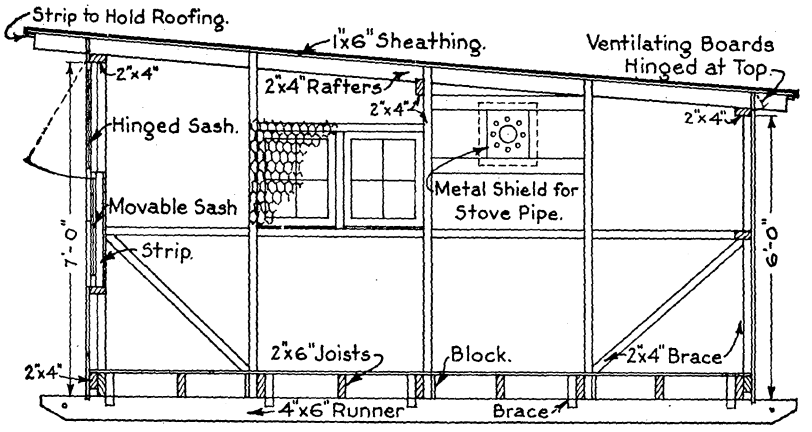


FIGURE 2.—A shed-roof type of colony brooder house with a capacity of about 300 chicks. Used at the United States Animal Husbandry Experiment Farm, Beltsville, Md.

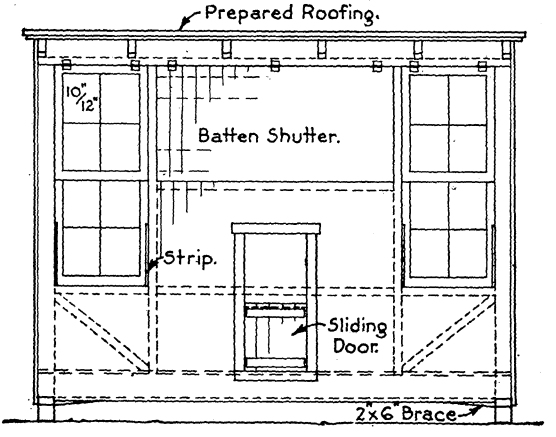
large a house as can be moved readily. The openings on three sides and the ventilating board in the rear under the eaves make the house comfortable for growing chicks in summer. The upper windows and shutters are hinged at the top and swing out to keep rain from coming in. The lower sash and the lower shutter are covered with a glass substitute that admits the desirable ultraviolet rays of the sun. The lower sections may be taken out in mild weather as soon as heat is no longer needed in the brooder house, to allow more ventilation and let direct sunlight into the house.

The colony brooder houses also provide quarters for the growing pullets if the cockerels are removed at an early age and the number of pullets is reduced in each house as the birds get older. Larger 2-room houses adapted for the use of oil- or coal-burning brooder

stoves can be made on a plan similar to that for the colony house, except that the front is made 20 feet wide instead of 10 and a partition is placed in the middle. The depth is 14 feet, as in the colony house. One section may be used for brooding and the other for feeding.



SECTION



FRONT ELEVATION

FIGURE 3.—Section and front elevation of colony brooder house to be heated with a stove. This is the house shown in figure 2 with a few changes. The batten shutter has been covered with glass substitute; another glass-substitute shutter, which is removable, has been placed below this; two chick doors are used instead of one; and the windows in the side have been replaced with one long window.

The heavy bracing shown in figures 3 and 4 is essential in any brooder house of this kind which is to be moved on runners. The brooder stove is usually placed about two-thirds of the way back from the front of the house, and the stove pipe may be set so that it goes out through the side of the house and then turns upward, extending above the level of the roof. A metal shield or collar should be used where the pipe comes out to prevent fire damage to the

building. The chimney may also be built to go through the roof directly above the stove, in which case special care must be taken to make the roof watertight and fireproof around the chimney. The windows on both sides of this brooder house and the opening for ventilation in the rear wall make this a well-lighted house and permit

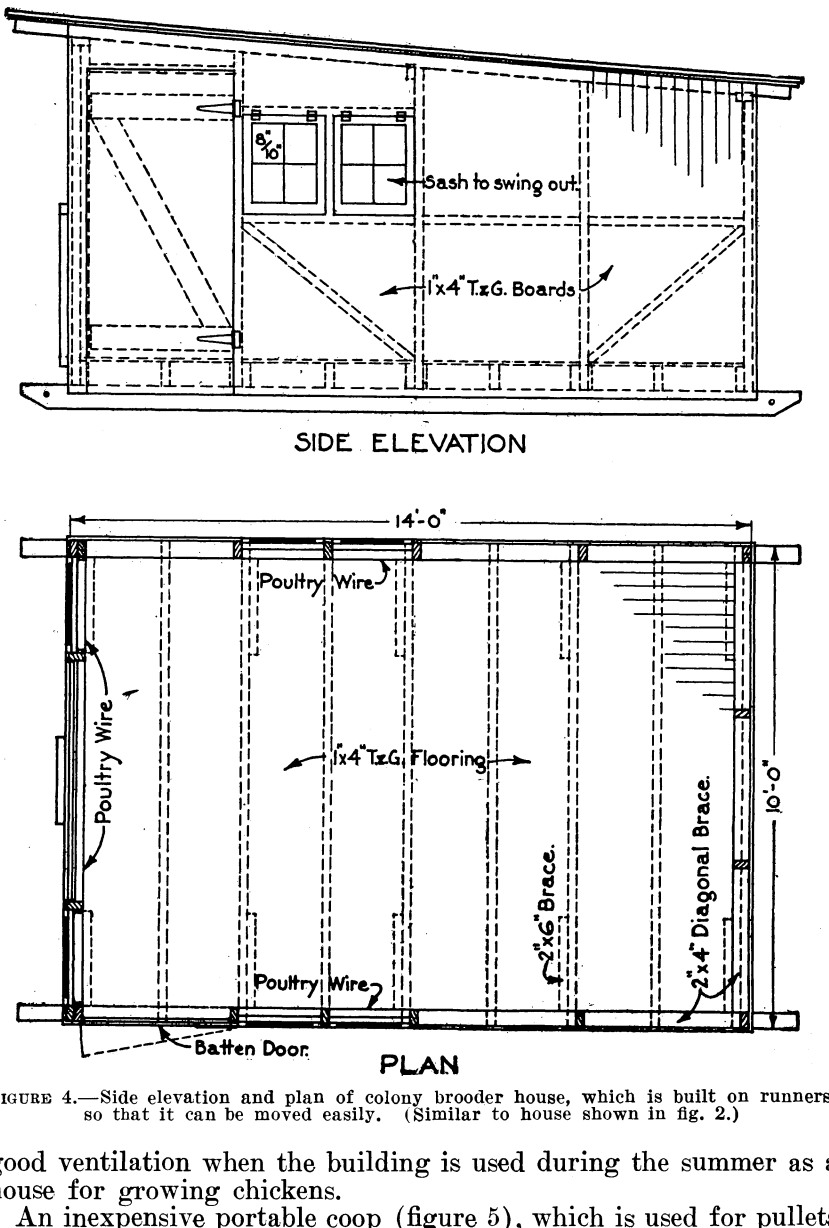


FIGURE 4.—Side elevation and plan of colony brooder house, which is built on runners, so that it can be moved easily. (Similar to house shown in fig. 2.)

good ventilation when the building is used during the summer as a house for growing chickens.

An inexpensive portable coop (figure 5), which is used for pullets after they are taken from the brooder house, makes an ideal house for growing chickens. A house of this kind, 10 feet square, used

entirely as roosting quarters, will accommodate 125 pullets. In some cases the roof is made of weatherproof composition board placed directly on the rafters.

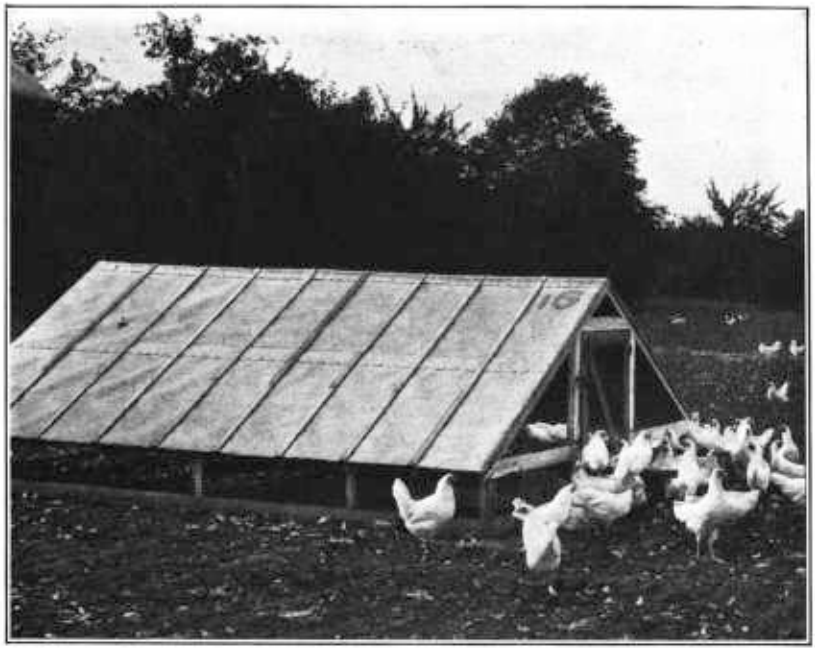


FIGURE 5.—A cheap, portable coop for growing chickens. The floor and sides of this coop are made of wire mesh, and the coop is easily moved.

List of materials for colony brooder house shown in figures 3 and 4

Lumber	Size	Pieces	Length	Board measure
Framing:	*Inches*	*Number*	*Feet*	*Feet*
Runners	4 by 6	2	16	64
Joists and braces	2 by 6	11	10	110
Studs	2 by 4	1	12	10
Studs and horizontals	2 by 4	7	14	66
Studs	2 by 4	2	16	22
Rafters	2 by 4	6	16	64
Studs, braces, and horizontals	2 by 4	7	10	47
Roof plates	2 by 4	3	10	20
Sheathing for roof and fascia	1 by 6			220
Tongue-and-groove flooring and siding	1 by 4			575
Total				1,198

2 single sash, 18 inches by 3 feet.
4 single sash, 4 lights, 10- by 12-inch glass.
2 frames 2 by 5 feet, covered with glass substitute.
70 square feet 2-inch mesh galvanized poultry wire.
Prepared roofing for area of 180 square feet.
Hinges, nails, paint, etc.

LONG BROODER HOUSES

Long brooder houses are used for hot-water-pipe brooders, which are especially desirable for winter brooding. They are better than the colony houses for the production of broilers if the birds are

marketed at an early age. To some extent, these houses are divided into pens about 16 feet deep by 14 feet wide, each pen being heated with a coal stove such as is used in the colony brooder house. Long brooder houses are better than colony houses for winter brooding in the northern part of the country.

If long brooder houses are used to raise pullets for egg production, it is desirable to have colony houses or growing shelters on range in which the pullets are grown to laying age after the brooding period is over. This requires two sets of buildings for raising the chickens and adds to the investment. These range shelters (fig. 5) are inexpensive and are very easily moved. They may also be used to house part of the pullets if the colony brooder system is used.

These long, hot-water-pipe brooder houses are made long enough for the desired capacity, but are usually from 75 to 150 feet long, varying in width from 14 to 25 feet. The house is usually divided into pens from 4 to 6 feet wide, with an aisle in the rear or north side of the building. A concrete floor should be installed, because it is sanitary and durable and practically rat-proof. The use of small brooder yards with floors of wire mesh, concrete, or cinders is advised, as small narrow dirt yards are very likely to become infected with disease germs and are difficult to keep clean. These wire or concrete yards are made as wide as the brooder pens and from 8 to 12 feet long.

Floors of heavy wire are placed a few inches above the ground and are built in sections on frames, which may be easily removed for cleaning. Concrete yards should have considerable slope, in order to aid in cleaning. The advantage of using these sanitary yards is that the chickens get the benefit of the direct sunshine and the extra space without coming in contact with infected soil. Very good results may be obtained by using brooder houses without any yards, many poultrymen preferring to follow that plan, making up for the lack of sunlight by feeding cod-liver oil. The windows in front of the brooder house may be made of glass substitutes which admit the ultraviolet rays. Plans of long, stationary brooder houses adapted for the use of the hot-water-pipe brooder system may be obtained from the manufacturer of the system.

LAYING HOUSES

The size of the flock determines the dimensions of the laying house. For instance, a back-yard flock is usually limited in number, and since the floor space required is not great the house is normally from 12 to 16 feet deep, whereas with a large commercial flock the house should be from 18 to 24 feet deep. The hens are more comfortable in deep than in narrow houses as the latter type of house is more subject to draft. On the other hand, in some sections of the country land is cheap enough and climatic and other conditions favorable enough so that flocks are housed in colony houses, each house accommodating from 25 to about 100 birds (fig. 11). In the case of most farm and commercial flocks, however, stationary houses are preferable because of the lower cost of construction, and because less labor is required in caring for the birds.

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On some poultry farms colony houses are provided for the breeders, and the layers are kept in the stationary houses. The advantages of this system are that the layers may be fed and managed in such a way that maximum egg production is obtained during the fall and winter. The breeders, on the other hand, are given a rest in the fall and then are provided with whatever range is possible before and during the breeding season in order that hatching eggs of the highest quality may be obtained. Stationary houses (figs. 6, 7, 8, and 9) are built as single units, as long continuous houses divided into sections, or as multiple-story laying houses. These large houses (fig. 9) are built from 2 to 6 stories in height and from 30 to 60 feet deep, and have a capacity of several thousand hens. The birds are kept confined in these houses. About 1 square foot of window space is provided for 50 square feet of floor space. In many cases large barns have been remodeled into multiple-story laying houses.

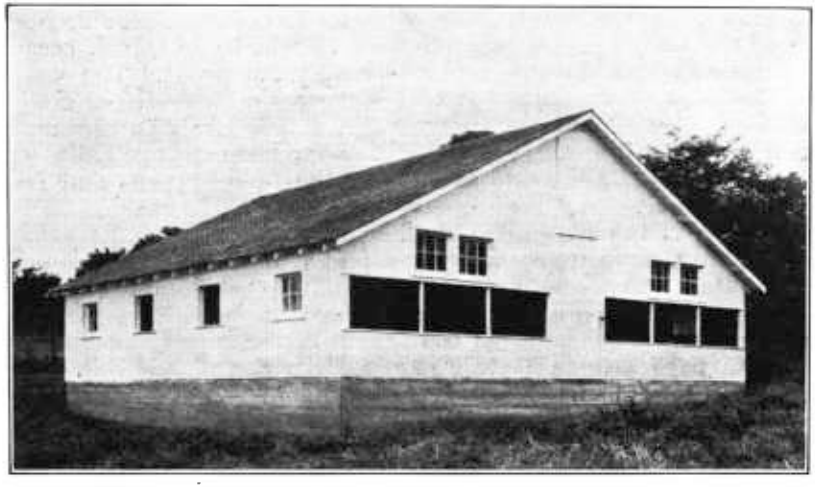

FIGURE 6.—A very satisfactory type of house for farm use. The Missouri straw-loft house, 30 feet square, will accommodate from 225 to 300 birds, depending on their size. The same type of house may be built 20 feet square to accommodate 100 birds.

If kept confined in these big poultry houses hens will not do well unless they receive suitable rations and the house is kept absolutely clean, well ventilated, and free from drafts. Other desirable houses suitable for different sections of the country are seen in figures 10 to 13, inclusive.

CAPACITY OF LAYING HOUSES

A house so built that the attendant can stand up and work conveniently will have cubic air space enough if from 2½ to 4½ square feet of floor space per fowl is allowed. The extent of floor space necessary depends on the housing system employed, size of flocks, weather conditions, and size of the birds. Where the climate is mild and the hens have free range most of the year, more birds can be kept on a smaller floor area under the colony system than under the intensive system. With good-sized flocks 3 square feet

of floor space per bird should be allowed for Leghorns and 4 square feet for general-purpose breeds. With small flocks, the space should be increased to 3½ square feet for Leghorns and 4½ square feet for general-purpose breeds. In a mild climate, when the birds are kept

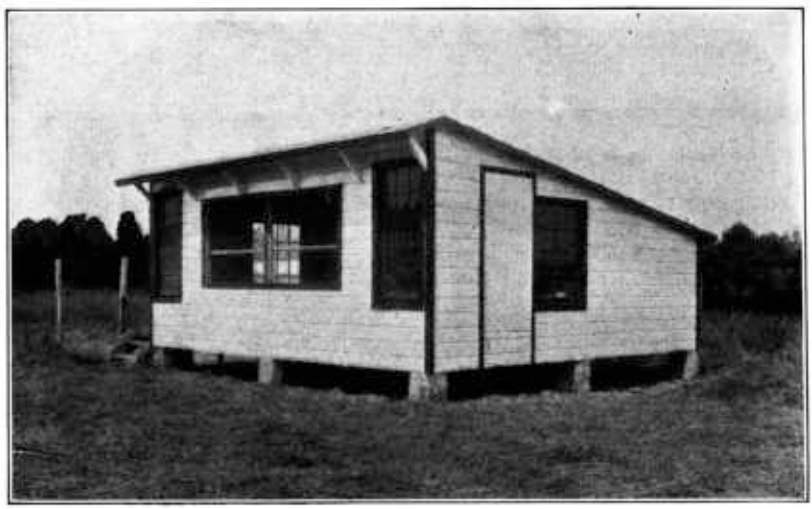

FIGURE 7.—The unit house of the type commonly used in New Jersey is very satisfactory in many sections. For best results the house should he 24 feet square, in which case it will accommodate from 150 to 200 birds. Glass or glass-substitute windows and cotton curtains are used in the front.

in colony houses with free range, a space of 2½ square feet is enough for Leghorns and 3 square feet for the general-purpose breeds.

Colony houses accommodating from 30 to 50 hens are about as large as can be moved easily (fig. 11), but larger numbers may be

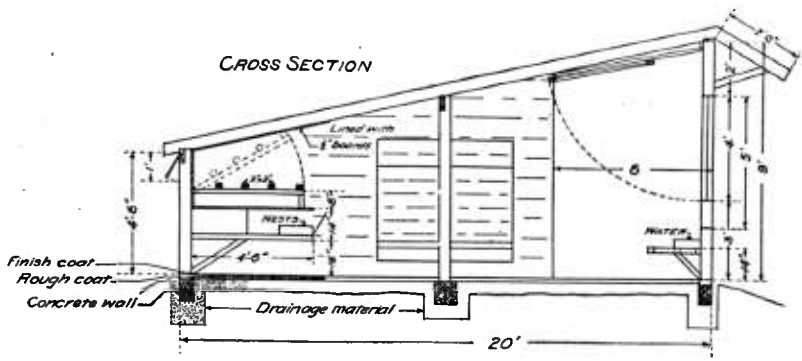

FIGURE 8.—Cross section showing construction of house in figure 7, with a double wall around the droppings board. This plan shows a concrete floor; the house shown in figure 7 has a wooden floor.

kept in one flock in a long house. Large flocks require less labor and fewer fences than small flocks, and the unit house cost is lower, but there is greater risk of disease, and the individual hen receives less attention.

YARDS AND FENCES

Laying fowls are usually confined to good-sized yards adjacent to the laying house rather than allowed to roam over the premises,

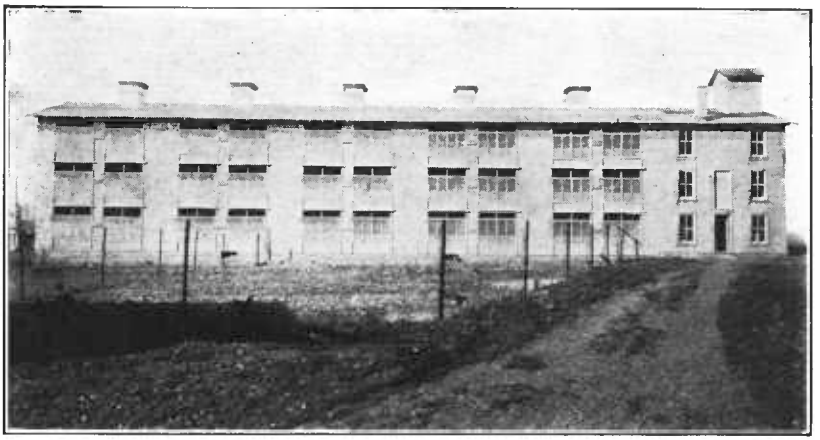

FIGURE 9.—Three-story laying house with glass-substitute windows arranged so that they will slide up and down. A projecting shield, as shown in figure 8, over the top of each row of windows, would help to keep this house dry.

as they can be managed more efficiently. They should not be allowed with other poultry or with cattle and hogs. The value of fresh, clean ground for poultry can hardly be overestimated, and the yards should be large enough so that they can be cultivated and

FIGURE 10.—This poultry house, commonly used in Massachusetts, is well lighted and ventilated. The yards in front make it possible to use the house for breeders.

sown to a grass or other green crop. On many farms hens kept for egg production and not for breeding are confined to the laying houses and no yards provided. Laying stock is usually confined to

FIGURE 11.—Colony laying or breeding house used near Washington, D.C. The house is 12 feet square and has windows made of glass substitute. Note the catching crate with slides removed from top and end.

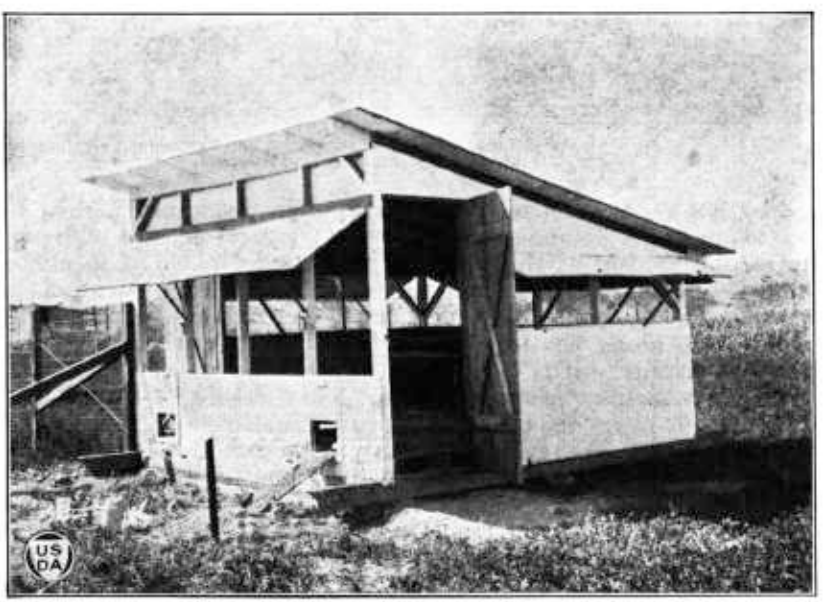

FIGURE 12.—A type of house used in the South. The illustration shows the method of providing adequate ventilation during warm weather.

the house throughout the winter months in all sections of the country except the South.

A good grass sward can be maintained on fertile soil by allowing from 220 to 260 square feet of land per bird (200 to 167 birds to the acre). More space per bird is necessary on poor grassland. A much larger number of fowls to the acre is usually kept on sandy soil, where double yards are used and the land is frequently cultivated. Under this system as many as 1,000 laying hens are sometimes kept on 1 acre, for egg production only, when the stock is not used for breeding and no chicks are raised. A desirable arrangement of yarding, especially where green feed can be grown most of the year, is to have a front and a rear yard of equal size for each house. These yards are usually made from 125 to 150 feet deep and as wide as either the pen or the house is long. The birds are alternated in these yards and a green crop is grown in each yard as soon as it is vacant.

The general-purpose and meat breeds require fences from 5 to 6 feet high, whereas Leghorns require a fence from 6 to 7 feet high.

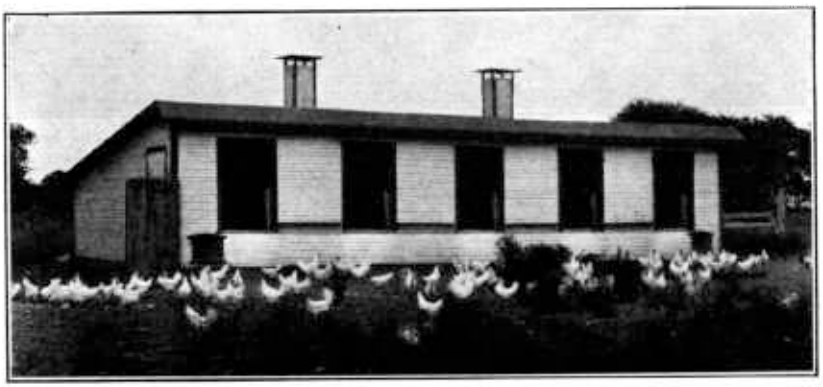

FIGURE 13.—A poultry house of the type used by many poultrymen in Michigan is insulated and equipped with roof ventilators.

To keep Leghorns in, it may help to slant in the upper foot of the fence at an angle of about 30 degrees. A strand or two of barbed wire strung on top of the woven wire often helps to keep a flock confined. It is sometimes necessary to clip the flight feathers of one wing of any bird which persists in getting out. A board or wooden strip along the top of the fence is not advisable, as hens will fly up to this board.

Wooden posts may be set or driven. They should be from 8 to 10 feet apart for common, hexagonal poultry netting or 16 to 20 feet for woven wire. Woven-wire fencing makes a better-looking fence and will last much longer than the common poultry netting. Corner posts should be about 8 inches in diameter, set 4 feet in the ground, and braced. Line posts may be 4 or 5 inches in diameter, set 3 feet in the ground. Creosoting the ends that will be below ground or treating them with some other preservative will make the posts last longer. Smaller metal posts or pipes, set about 10 feet apart, give a neater appearance to the fence than wooden posts and are easily driven into the ground.

DETAILS OF DESIGN

ROOF

The roof of any type of poultry house should be well constructed and made watertight. Shingle roofs should have not less than one-third pitch, whereas composition or metal roofs may have less pitch or be almost flat. However, the roofs with considerable pitch will last longer and are less likely to leak than roofs which are nearly flat. Different types of roofs are illustrated in figure 14.

The shed or single-slope roof (fig. 14, *A*) is practical for houses up to 20 feet or so in width if a girder and posts support it at the center. A girder is needed only in shed-roof houses wider than 14 feet, except in sections where there is considerable snow, in which case a girder should be used in all houses over 12 feet wide. Twenty-four feet usually is the maximum width for a house for laying hens, although even wider houses are used successfully. Houses 20 feet wide are in most common use. The present tendency is to build

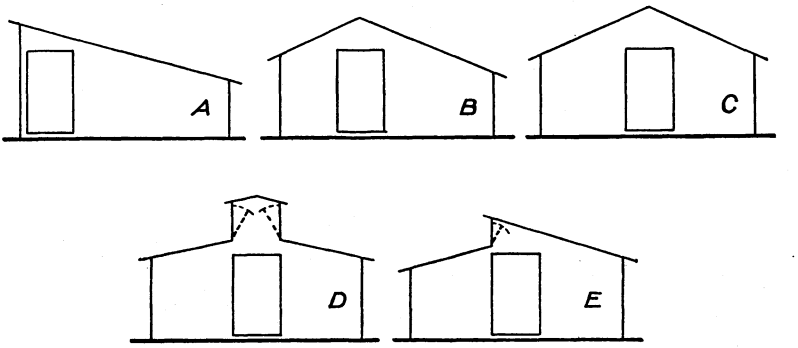

FIGURE 14.—Types of roofs of poultry houses. *A*, Shed; *B*, combination; *C*, gable; *D*, monitor; *E*, semimonitor.

deeper and larger poultry houses. The shed-roof type is practical and easy to build and gives the house a high front.

The combination roof (fig. 14, *B*) and the gable (fig. 14, *C*) are adapted for buildings from 16 to 24 feet wide, while the semi-monitor roof (fig. 14, *E*) or the monitor (fig. 14, *D*) may be used for wider buildings. The combination roof on a house more than 16 feet wide gives good headroom at a moderate cost, reduces the surplus air space, and makes a good-looking building. The shed-roof type is cheaper but not so good looking.

The gable roof is used extensively for large poultry houses, for multiple-story buildings, for brooder houses, and for incubator cellars. This style of roof may be ceiled at or slightly above the eaves, or a wire or lath ceiling be used, covered with about a foot of straw, which tends to keep the house dry and warm. There should be an opening in each gable in straw-loft houses to allow air circulation, and roof ventilators should be provided for long buildings.

The semimonitor type is used for a very wide house which has a central alley, as this type allows more sunlight in a deep house.

The house with a semimonitor roof usually faces south. The monitor type of roof may be used on laying houses or brooder houses facing east and west. Laying houses having either of these types of roofs are inclined to be drafty and are difficult to keep comfortable in cold weather.

FRONT AND REAR

A laying house with the entire front open is commonly used in the South. One in which from one-fourth to one-third of the front consists of curtains and windows is used in the northern part of the United States. Curtains and windows make up from one-third to three-fourths of the front of the house in most other parts of the country (figs. 10 and 15). The openings in the front are covered by glass or glass-substitute windows and cloth curtains, so that the amount of open space can be varied according to the season and

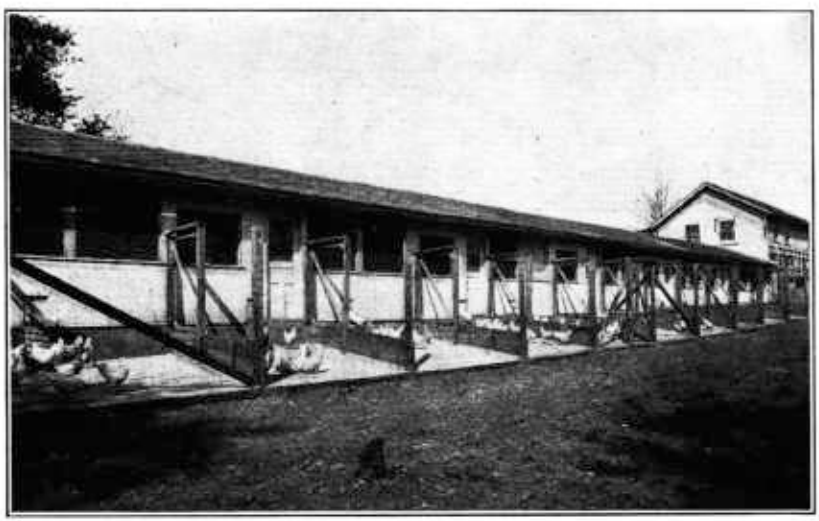

FIGURE 15.—Combination-roof laying house in Maryland, with half of the front of curtains and windows. The hens get sun baths in the concrete yards.

weather conditions. A large area of glass or glass substitute in the front of the building makes the house warm during the day and cold at night, as glass radiates heat very rapidly. Unbleached muslin or burlap sacks may be used for curtains in the fronts of poultry houses. Little if any air goes through muslin curtains but these curtains provide protection from rain and wind, and there usually are enough cracks around the frames to provide considerable ventilation.

Windows in the rear of the poultry house, between the floor and the droppings boards, as shown in figures 16, 17, and 18, are desirable in wide houses. Larger windows than those illustrated may be used. They let in more light on the floor, provide additional ventilation for warm weather, and help to keep the litter better distributed, as hens always scratch the litter away from the light.

A weather shield from 1 to 2 feet wide (figs. 7 and 13) extending downward like an awning at an angle of 45 degrees from the top

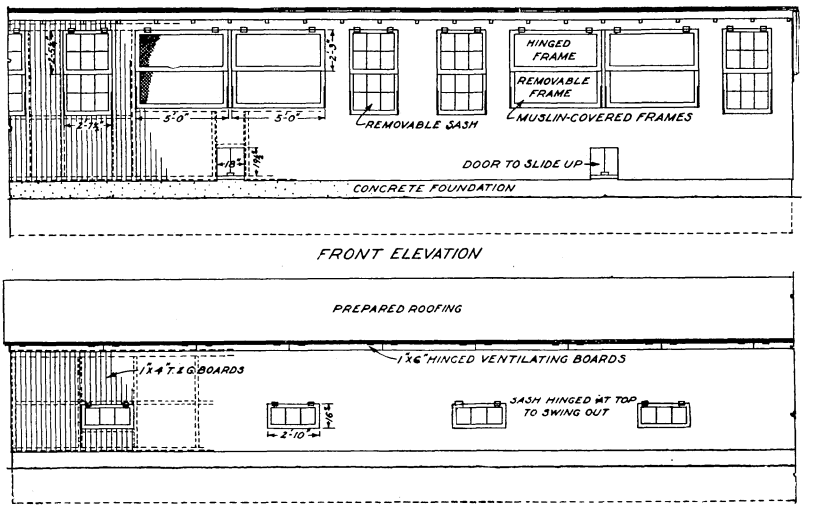

FIGURE 16.—Front and rear elevation of one section of shed-roof laying house, 20 feet deep. (See figs. 17 and 18.)

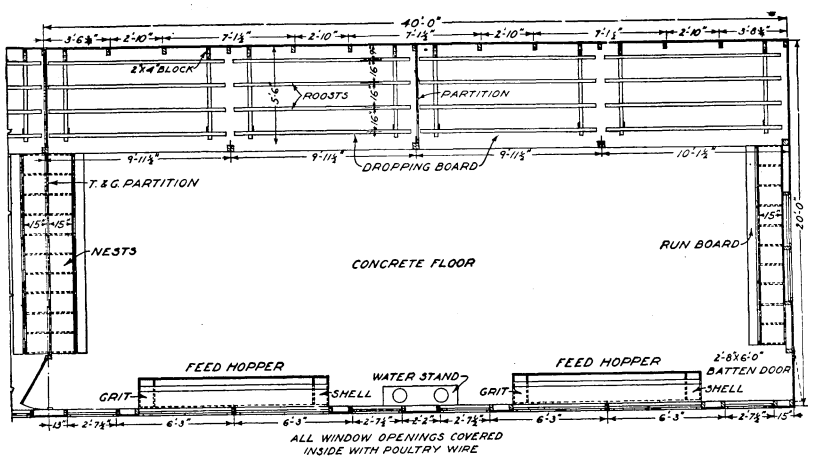

FIGURE 17.—Plan of the shed-roof laying house shown in figure 16. Each pen is 20 feet deep by 40 feet wide, and has a capacity for from 200 to 225 hens.

of the front, prevents rain from beating into the house but tends to shut out the sunshine. A shield 1½ feet wide could be used on the front of the house in figure 18.

In order to give extra ventilation in hot weather, in most sections of this country an adjustable ventilator opening should be made in the rear of the house. This opening is usually made the entire

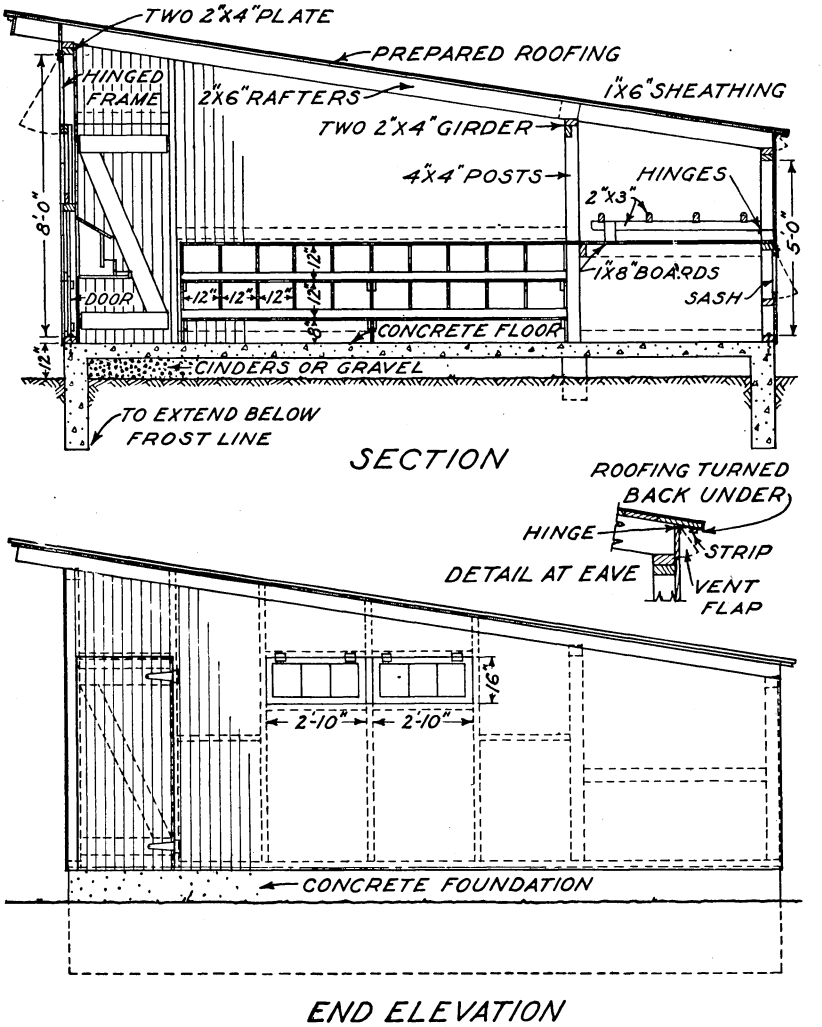

FIGURE 18.—Section and end elevation of the large shed-roof laying house shown in figures 16 and 17.

length of the house, between the plate and the eaves. It must be made so that it can be closed tightly in cold weather. Such an opening is shown in figures 16 and 18 and a larger one in figure 8. The use of double-wall construction on part of the north wall and ceiling behind and over the roosts is recommended for the northern section of the country. This double wall (fig. 8) prevents a direct

draft from blowing over the chickens on the roost when the rear ventilator is open.

A list of materials for the type of house shown in figures 16, 17, and 18 follows.

List of materials for two sections of a shed-roof house, 20 by 80 feet, as shown in figures 16, 17, and 18

Lumber	Size	Pieces	Length	Board measure
Framing:	*Inches*	*Number*	*Feet*	*Feet*
Sills	2 by 4	24	10	160
Rear studs	2 by 4	14	10	93
Front studs	2 by 4	32	8	171
End studs	2 by 4	6	12	48
Posts	4 by 4	4	12	64
Purlins	2 by 4	16	10	107
Plates	2 by 4	32	10	213
Rafters	2 by 6	44	16	704
Rafters	2 by 6	22	12	264
Horizontals	2 by 4	24	10	160
Droppings board	2 by 4	8	10	53
Studs, partition	2 by 4	3	8	16
Horizontals, partition	2 by 4	2	10	13
			Lin.ft.	
Roosts	2 by 3		400	200
Vent board, surfaced, 4 sides	1 by 6		80	40
Eave strip	1 by 2		186	31
Fascia on rafters	1 by 6		82	41
Frame for curtain	1 by 3		240	60
Tongue-and groove roof sheathing	1 by 6			2,000
Tongue-and-groove flooring (covering)	1 by 4			1,400
Tongue-and-groove flooring (droppings board and small partitions)	1 by 4			650
12-inch boards, surfaced 4 sides, for nests, etc				650
Tongue-and-groove flooring (partitions)	1 by 4			375
Total				7,513

304 square feet 2-inch mesh poultry wire.
160 square feet muslin or glass substitutes or frames.
Roof covering for area of 1,800 square feet.
12 cellar sash, 3 lights, 10- by 12-inch glass.
16 sash, 6-light, 10- by 12-inch glass.
29 pairs 2-inch galvanized butts for cellar sash vents.
16 pairs 2½-inch galvanized butts for other sash and frames.
3 pairs 5-inch T hinges for doors.
20½-inch diameter foundation bolts 16 inches long, with nuts.
Concrete: Foundation, 70 sacks portland cement, 7.6 cubic yards sand, 12.6 cubic yards gravel; floor, 96 sacks portland cement, 10.4 cubic yards sand, 17.2 cubic yards gravel.
Nails, paint, etc., as required.

The front of the house should be high enough so that the windows or openings will allow the sun to shine well back into the house in winter. The depth of sunshine on the floor of the house in the vicinity of Washington, D.C. (latitude 39° N.) on January 1 is given in table 1.

TABLE 1.—*Relation between height of windows and depth of sunshine in house.*

Height of top of windows		Depth of sunshine	Height of top of windows		Depth of sunshine
Feet	*inches*	*Feet*	*Feet*	*inches*	*Feet*
3	6	8	6	2	14
4	5	10	7	1	16
5	4	12	7	11	18

The arrangement of the windows and openings over which curtains are used should provide not only for ventilation and proper

lighting of the house, but for access of the greatest amount of direct sunlight when the windows are opened and the curtains raised. Direct sunlight is very beneficial in keeping the hens in good health and in promoting the efficient use of minerals which the birds consume. The ultraviolet rays of the sunlight do not penetrate ordinary glass and are partly shut off by glass substitutes or curtains. Whenever it is possible, without causing drafts, the front of the house should be opened.

There are a number of glass substitutes and special glass products which admit a considerable percentage of these desirable rays of the sun (fig. 11). These are being used quite generally in place of windows in laying and brooder houses. Some of these glass substitutes are good for only a few years' use, which makes it advisable to purchase the best product of this kind and to store it during the summer months where it will be protected from the sun's rays.

FLOOR

The kind of floor which is best for a poultry house depends on the size and use of the house, the slope of the land where the house is to be built, and the soil.

Concrete floors usually are the best for long, permanent buildings, brooder houses, incubator cellars, and all permanent or stationary houses. Concrete floors are easy to clean, very sanitary, rat-proof, and comparatively inexpensive where gravel and sand are cheap. Concrete floors should be well insulated and should be bedded with straw or some kind of litter, especially in winter, so that they will be dry and not too cold. They should always be placed a few inches above the ground level.

Floors may be made of lumber if the floor level is from 1½ to 3 feet above the ground, or if the land is very uneven or sloping. Board floors too close to the ground make rat harbors and soon rot out. They should be high enough from the ground to permit dogs to go under them and to permit circulation of air to keep them dry. Portable houses commonly have board floors.

Dirt floors are insanitary and dusty; they cannot be kept clean and serve as a harbor for rats. Litter does not last nearly so long on dirt floors as on either concrete or wooden floors. The use of dirt floors is not advised.

Recently the use of wire floors made up of portable frames covered with heavy wire has been tried in brooder houses and laying houses. Their use eliminates the need for litter and provides a floor that is always clean. Permanent wire floors are well adapted for colony houses for growing chickens, but the use of wire floors in other types of houses is still in the experimental stage.

PARTITIONS

In long laying houses it is desirable to have solid partitions at least every 40 feet to prevent drafts. The roosts should be additionally protected from drafts by installing solid sections at least every 20 feet, extending back from the front of the droppings board and upward to the roof. These sections will prevent drafts on the birds while they are on the roosts and also keep the birds from overcrowding in one section of the roosts. Wire netting may be used for the

upper part of the partitions built between the solid ones, provided that the construction of the lower 3 feet is made solid to prevent the birds from fighting (figs. 17 and 18).

ROOSTS AND DROPPINGS BOARDS

The interior fixtures of the pens should be simple, inexpensive, and easy to clean. Roosts and droppings boards may be removable for convenience in cleaning, but satisfactory results are also obtained if they are made permanent with as few cracks and hiding places for mites as possible. The use of carbolineum (anthracene oil) or a wood preservative of this nature on the roosts and supports will

FIGURE 19.—Interior of a laying pen which is equipped with movable droppings boards, inexpensive mash hoppers, electric lights, and an automatic watering trough.

ordinarily kill any insect pests that may hide in or near the fixtures. In some sections of the United States, however, where insect pests are difficult to control it may be desirable to have removable fixtures and portable droppings boards built with legs like a table (fig. 19). These can be moved away from the wall, will permit good ventilation for the hens at night, and are especially desirable for houses where artificial heat is used.

Roosts are usually placed next to the back walls, from 6 to 8 inches above the droppings boards; the latter are from 20 inches to about 3 feet above the floor. All roosts should be on the same level; otherwise the birds will crowd and fight to get on the highest. Scantlings 2 by 3 inches or 2 by 4 inches, with the narrow surface up and upper edges rounded off, make good roosts. By hinging the roosts to the back of the house the droppings boards may be readily cleaned, and this arrangement also makes it easy to disinfect both roosts and droppings boards properly. Seven inches of roost space per fowl should be allowed for Leghorns and 10 inches for Plymouth Rocks or

birds of that size. Larger fowls require still more space. As many roosts should be used as are necessary to accommodate the fowls comfortably, 3 roosts generally being used in 16-foot houses and 4 and sometimes 5 in houses 20 to 24 feet deep. These roosts are usually placed lengthwise of the building. Short roosts placed crosswise (fig. 20) instead of lengthwise are sometimes used, but are more difficult to build and do not seem to prevent the hens from crowding on the roosts. Roosts should be placed about 13 inches apart for Leghorns and 15 inches apart for Plymouth Rocks, but the outside ones may be within 10 inches of the edge of the droppings boards.

FIGURE 20.—Droppings board equipped with short crosswise roosts and with wire netting under them.

It is good practice to place 1½-inch-mesh wire netting immediately beneath the roosts so that the hens cannot pick at the droppings. This prevent the hens from consuming the many worm eggs frequently contained in the droppings.

MATERIALS FOR BUILDING

Wood is the cheapest and most commonly used material for building poultry houses. A building constructed of wood can be moved, torn down, or changed more readily than one constructed of hollow tile, brick, or concrete. Any durable lumber available may be used. The lumber for the outside construction should be well seasoned; otherwise the shrinkage will leave cracks in the walls. Second-hand lumber is frequently used.

Hollow tile makes a good poultry house and can be bought in some sections at a price which, considering its durability, compares favorably with the cost of wood. This construction is well adapted to incubator cellars and brooder houses or to any buildings requiring

double walls and good insulation, though it is not commonly used for poultry houses with single walls because of the higher cost. Houses made entirely of solid concrete are cold and damp.

ESTIMATING MATERIALS REQUIRED

Lumber comes in even lengths, usually 10, 12, 14, and 16 feet. It is figured at so much per 1,000 feet board measure, which means the number of square feet which the material would cover if it were 1 inch thick. The number of feet, board measure, in dressed lumber is based on the size of the lumber before it is dresed. The width of matched flooring is usually based on the width of the board before it is dressed and before the tongue and groove have been made. To compute board measure, multiply the width in inches by the thickness in inches, and multiply this by the length in feet, and then divide this result by 12. Table 2 shows the number of feet, board measure, in lumber from 6 to 16 feet long, with a cross section varying from 4 to 16 square inches.

TABLE 2.—*Board measure*

Length	Board measure when the area of cross section of a board is—					
	4 square inches	6 square inches	8 square inches	10 square inches	12 square inches	16 square inches
Feet	*Ft. In.*	*Feet*	*Ft. In.*	*Ft. In.*	*Feet*	*Ft. In.*
6	2 0	3	4 0	5 0	6	8 0
8	2 8	4	5 4	6 8	8	10 8
10	3 4	5	6 8	8 5	10	13 4
12	4 0	6	8 0	10 0	12	16 0
14	4 8	7	9 4	11 8	14	18 8
16	5 4	8	10 8	13 4	16	21 4

Boards less than 1 inch thick are usually sold by the square foot, the price depending on the kind, thickness, and grade of the lumber. In estimating lumber an allowance should be made for waste, adding one-seventh for common sheathing, one-fifth for matched lumber 6 inches wide, one-fourth for matched siding or lumber 4 inches wide, and one-third for matched flooring 3¼ inches wide.

If a blueprint or working plan of the poultry house is not available, a plan of some kind should be drawn, on a convenient scale, about one-fourth inch to the foot, showing the ground plan, the front elevation, and the end or a cross section of the house. The materials needed can be calculated from the drawings.

Wire nails are generally preferred in construction, as they are easier to use than cut nails, although the latter have greater holding power and are less likely to split the boards. Use tenpenny to twentypenny nails for framing, eightpenny to tenpenny for sheathing, eightpenny for siding, and sixpenny finish or casing nails for clapboarding. It takes about 5 pounds of fourpenny nails for 1,000 shingles, 18 pounds of sixpenny for 1,000 square feet of beveled siding, 20 pounds of eightpenny and 25 pounds of tenpenny for 1,000 square feet of sheathing, 30 pounds of eightpenny for 1,000 square feet of flooring, and 15 pounds of tenpenny and 5 pounds of twentypenny for the studding in 1,000 square feet of frame wall. In building portable houses the nails for the framing should be as large as the material will allow so as to provide greater strength.

A cubic yard of 1:3:5 concrete will take 4.64 sacks of cement, 0.52 cubic yard of sand, and 0.86 cubic yard of gravel. A cubic yard of 1:2 mortar surface will take 13.48 sacks of cement and 1 cubic yard of sand. A concrete wall can be made entirely of rough concrete; the wall should be 6 inches wide and about 2 feet in the ground, and the top of the wall is usually made level with the top of the floor. The bottom of the wall should go below frost depth.

CONSTRUCTING THE HOUSE

FRAMEWORK

The framework consists of the sills, which support the building; the studs or uprights, which rest on the sills; the plate, which is on top of the studs; and the rafters, which rest on the plates.

The sills are placed on concrete supports, concrete walls, or wooden posts. Wooden posts should be from 6 to 8 inches in diameter; they should be placed 6 to 8 feet apart and 2 to 3 feet in the ground or below the frost level. Cedar, locust, chestnut, redwood, and cypress are preferable to most other woods. Concrete posts may be used in place of wooden posts, and are much more durable. Concrete blocks or hollow tile also may be used for supporting poultry houses.

The sills may be 2 by 4 inches or of heavier material, depending on the size and construction of the building. Sills 2 by 4 inches are heavy enough for colony houses or other buildings of light, single-wall construction if sufficiently supported, whereas sills 4 by 4 inches are used for larger buildings and for houses with double walls. Sills 4 by 6 inches are used in 2-story henhouses or other poultry buildings, and should be set on edge, unless on a concrete or stone wall, when a 4- by 4-inch sill may be used. The posts or supports must be set close together if light sills are used. Laying houses which are 3 or 4 stories in height require heavier framing than is needed for 1- and 2-story buildings. Concrete walls are commonly used as foundations for large poultry houses, with a sill 2 by 4 or 4 by 4 inches, which is bolted to the walls.

Runners 3 by 4 inches or 4 by 6 inches are used as sills for portable houses, which require heavy framework. Portable houses which are to be moved on runners must be braced extra well in the corners to stand the strain of moving.

Floor joists may be of 2- by 4- or 2- by 6-inch lumber, depending on the span. They should be from 16 to 20 inches apart. If the span is more than 10 feet, a center support should be used for 2- by 4-inch joists.

To square the corners of a poultry house, fix one line or side of the proposed house. With this as a base, locate the other corner posts by using the 6-, 8-, and 10-foot combination, measuring 6 feet from one end of the fixed line and 8 feet from the same end at right angles. The angle between the two lines is fixed by a rule 10 feet long running from the 6-foot mark of the fixed line to the end of the 8-foot line, thereby making a square corner. A triangle whose sides are 6, 8, and 10 feet long, respectively, contains a right angle opposite the diagonal side.

The sill in small buildings may be made level by driving a stick at one corner of the house, to which a straightedge or a long, straight

stick is nailed at the desired height of the posts or sill. A spirit level is used on this straightedge to make the posts at the right height or to make the sill level. A transit is sometimes used in laying out large buildings.

The studding is toe-nailed to the sill and should be braced well until sheathed. The corner studs should be set plumb and the other studs measured from these. The studding is set from 2 to 4 feet apart for the rear walls and is placed to fit the windows, curtains, and doors in the front and ends. The studs should be placed so that the lumber will cut with little waste. Less studding is required if the building is boarded up and down rather than horizontally, as in the former case only a few studs with cross studding or ties are required. Studs 2 by 4 inches are commonly used, except that in large houses the corner studs are generally doubled, making them 4 by 4.

Sills and plates are halved or spliced and nailed together at the joints or ends, which should be made over a post or stud. The plates are spiked at the top of the studding and are made of 2- by 4-inch scantling laid flat on top of the studs, or 4 by 4 made by spiking two 2 by 4's together.

Rafters may be 2- by 4-inch or 2 by 6, the 2 by 4's being used only in light buildings where the clear span is not more than 12 feet, and 2 by 6's for longer spans and in climates where roofs have to bear much snow.

It is advisable to use purlins or girders in buildings where rafters are more than 12 feet long. Purlins are usually made of 2- by 6-inch material set on edge on posts to support the roof. They are placed lengthwise of the house about midway the length of the rafters, which rest on them. In a deep house which has a wide droppings board the purlin may be placed at the front edge of the droppings board, so that the posts supporting the purlin will not be in the way in the pens (fig. 18).

In roofs that form a ridge a board may be placed between the ends of the rafters to keep the ridge straight and even, but this is necessary only in large poultry houses. Collar beams or crossties 1 by 6 inches are used to prevent the spreading of the rafters on gable or combination roofs. They should be placed as low as possible on the rafters, so as to stiffen the frame, but not so low as to interfere with head space. If the hens roost on them, cover the space between them and the rafters with wire netting.

In erecting the rafters one pair may be set in position and the rest marked from these. They should be notched only deep enough to make a snug fit and to provide good nailing on the plates. Rafters are usually spaced 2 feet apart, from center to center, so that the roof boards will cut with minimum waste.

FLOORS

Concrete floors will be damp and cold if they are laid directly on the ground. To avoid this condition the floor should be laid on a deep porous foundation (fig. 18) and should be well insulated. It is absolutely essential to keep the floor of the poultry house dry. Concrete floors should be kept well covered with litter.

The best concrete floors are made by first putting down a firmly tamped foundation of cinders, broken stone, or gravel about 6 inches

deep and then laying on it from 3 to 4 inches of concrete. A layer of tarred building paper, lapped and cemented with tar at the seams, may be placed between the stone foundation and the concrete to prevent moisture from coming through the earth and concrete and making the floors damp. Care should be taken not to break holes in the paper. Detailed information on the use and mixing of concrete is given in Farmers' Bulletin 1279, Plain Concrete for Farm Use.

Wooden floors, in the milder sections of this country, are usually made of one thickness of matched flooring. In the northern sections they should be doubled to make them tight and warm, in which case the lower layer of boards is usually laid diagonally and building paper placed between the floors. The space below the floor is loosely boarded up to help keep the floor warm.

WALLS

The walls of most poultry houses are built of one thickness of siding or flooring nailed directly to the studs. In the colder sections of the United States siding is usually placed over sheathing, with building paper between, making a wall of two thicknesses of boards. Matched lumber seven-eighths inch thick, placed vertically, is used extensively in poultry-house construction and makes a very satisfactory wall without any other covering. Lumber from 2½ to 6 inches wide is generally used, as wide boards are likely to shrink so much as to leave cracks.

The lowest board on the walls should extend over the top of the sill to cover the joint. A tight joint should also be made at the eaves, either by cutting the rafters off even with the rear wall and covering this joint with good roofing paper or by filling in the space between the rafters with boards. A wide board may be used as the first board on the rafters, allowing it to project from 2 to 4 inches beyond the rear wall, to protect the rear wall of the house. The sheathing should be from 6 to 8 inches wide and should be laid so as to break joints in order to strengthen the building. Siding is usually laid from the bottom upward and also with joints broken. A shutter may be placed just under the eaves on the outside of the rear wall for summer ventilation (figs. 8, 16, and 18). The essential point is to have a rear wall which is tight near the roosts, to prevent drafts from striking the birds.

ROOFING

Prepared roofing, laid on wide matched sheathing, is ordinarily used for covering the roof. Two-ply roofing material is used on the sides, and 2- or 3-ply roofing on the roof, the choice varying with different styles and grades of manufacture. This prepared roofing may be had either in the form of shingles or in rolls. Directions and materials for laying are supplied with the roofing. The sheathing should be planed on one side and laid close together, with the surfaced side up to present a smooth surface for the prepared roofing. Sheathing paper is sometimes used between the sheathing and the roofing material. Prepared roofing may be used on roofs that have a slope of 1 inch or more to the foot.

Such roofing will last longer on a roof that has considerable slope than on a roof that has only a slight slope. A shed roof is the

easiest to cover with prepared roofing, which lasts especially well on this type of roof because it has a northern exposure and is not so much affected by the sun. A good way to fasten the loose ends of roofing paper is to bend them under the sheathing, fastening the paper with a narrow board (fig. 18).

Wooden shingles are used in a few sections of the country, principally on the Pacific coast. Shingles may be laid from 4 to 5 inches to the weather on roofs having at least a one-third pitch, which is a rise of 8 inches to the foot. Wooden shingles should be laid on narrow sheathing 3 to 5 inches wide, or on common sheathing. The shingles should be laid so as to break joints at least 1 inch. The sheathing boards should be spaced about 3 inches apart to allow the roof to dry out quickly.

PAINT AND WHITEWASH

Paint adds greatly to the appearance of poultry buildings and usually increases their durability. All surfaces should be clean and dry before they are painted. Use a priming coat made of about equal parts of paint and linseed oil and cover with one or more coats of paint, which should be thoroughly brushed into the wood.

Whitewash is cheap and may be used both inside and outside the building. It is made by slaking quicklime in water and thinning to the consistency of paint. The lime should be placed in a vessel and water poured over it, covering the vessel with cloth or burlap, and allowing the lime to slake for 1 hour. Powdered whitewash ready for mixing with water may be purchased on the market.

A whitewash to be used on the interior of the building may be made in the following manner: (1) Slake 1 bushel of quicklime and dilute with water to 15 gallons; (2) beat 2½ pounds of rye flour in one-half gallon of cold water and then add 2 gallons of boiling water; (3) dissolve 2½ pounds of common rock salt in 2½ gallons of hot water; mix (2) and (3), then pour into (1), and stir until thoroughly mixed.

A whitewash for exterior surfaces may be made as follows: (1) Slake 1 bushel of quicklime and dilute with 12 gallons of hot water; (2) dissolve 2 pounds of common salt and 1 pound of sulphate of zinc in 2 gallons of boiling water; pour (2) into (1), then add 2 gallons of skim milk, and mix thoroughly. Spread the whitewash lightly over the surface with a broad brush, or put it on with a spray pump. Detailed information on painting and whitewashing will be found in Farmers' Bulletin 1452, Painting on the Farm.

ARTIFICIAL LIGHTS

Most commercial poultrymen and many of the smaller flock owners are using artificial lights in laying houses to give the hens a 12- to 14-hour day during the winter months. The use of artificial lights does not increase the total yearly production of eggs so much as it increases the proportion of eggs laid during the fall and winter months, when egg prices are highest. The lights are used for pullets from October 1 to the latter part of March.

Forty-watt electric lamps placed about 10 feet apart, with 2 lights in a pen 20 feet square (fig. 19), provide suitable light for the purpose. The light should be about 6 feet high and should have a

reflector 16 inches in diameter and 4 inches deep. The lights should be arranged to give some light on the roosts but with the greatest concentration of light on the mash hoppers and water utensils.

Electric lights are commonly used, as these can easily be turned on by hand or automatically controlled by a clock. Oil and gasoline lights are sometimes used. When lights are used at night it is necessary in cold weather to warm the drinking water to prevent its freezing, and thus make the water available to the birds when the lights are turned on.

ARTIFICIAL HEAT

Artificial heat is being used to a very limited extent in houses for laying hens. Some heat may be desirable to keep the house dry and to prevent the drinking water from freezing, but it is not considered either economical or desirable to maintain a temperature higher than is necessary to accomplish these results. Only poultry houses which are well built and well insulated can be heated economically. Less ventilation during the winter months is used in heated than in unheated houses. The laying house may be heated by a hot-water heating system or by small stoves in the pens.

INSULATION OF THE WALLS AND ROOF

The insulation of a laying house is much more common than the use of artificial heat in the house. It is a common practice to construct a double wall on the rear wall and ceiling above the droppings board (fig. 8). The roof and rear walls of some of the houses in the colder sections of this country are insulated with prepared composition board or made double (fig. 13). Insulated walls tend to prevent both sudden changes in temperature in the house and the condensation of moisture on the inside walls of the house.

VENTILATION

Ventilation in poultry buildings is usually controlled through the windows and openings in the front of the house. The number and size of the openings will depend on the section of the country and the weather conditions. Good ventilation is obtained by opening the windows and curtains during the day in good weather and partially closing them at night and by adjusting the size of the openings to the weather conditions. Openings in the rear of the house are desirable for additional ventilation in warm weather. Restricted ventilation can be used in well-insulated buildings without making the room damp. In the colder sections of the country restricting the ventilation to openings 4 to 18 inches wide, high up in the front of the house during most of the winter, removes most of the dampness without making the house too cold. Openings between the rafters in the front of the house help to keep the air in the house dry. On cold nights the rafter ventilation is all that is needed. Enough ventilation may be obtained through windows if these extend up to the plate; in such buildings the rafter openings need not be made.

Ventilator flues extending from the ceiling through the roof may be used in houses 24 feet or more in depth, if the house is well insulated and the ventilation is carefully controlled. They are not usually considered necessary in narrower poultry houses which are only one story high. About 1 square foot of flue area is provided for each 100 hens and the flues placed just in front of the droppings board. These flues should be built with a slide so that they can be adjusted to changes in temperature.

FIXTURES AND EQUIPMENT

Fixtures such as nests, mash hoppers, and other equipment in poultry houses should be durable and well adapted for the purpose

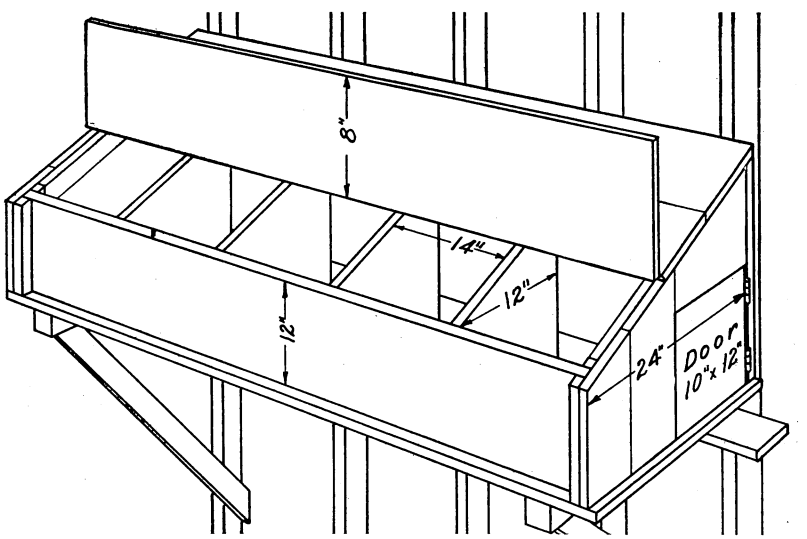

FIGURE 21.—Simple, convenient, and practical wall nests, so arranged that hens enter from the rear. The door is opened for gathering eggs; otherwise the nests are dark, which tends to prevent the egg-eating habit from developing. The front board is removable for cleaning the nests.

intended. Avoid an excessive use of fixtures; otherwise they will tend to make the house much more difficult to keep clean and add an unnecessary expense to the building.

NESTS

Nests may be placed on the partition or end walls, but should be high enough above the floor so that the fowls can work under them. They should also be arranged so that the hens can get into them easily. It is not advisable to place the nests under the droppings board if there is any other convenient place where they can be arranged. The nests should be from 12 to 14 inches square, depending on the size of the hens, about 12 inches high, with a strip about 4 inches high on the open side to retain the nesting material. Cheap nests may be made of egg crates or orange boxes. One nest should be provided for every 4 or 5 hens.

It is highly advisable to have darkened nests built out from the wall so that the birds enter the nests from the rear, the front or top of the nest being made of a long door which can be opened for gathering the eggs (fig. 21). The advantage of using darkened nests is to prevent the egg-eating habit.

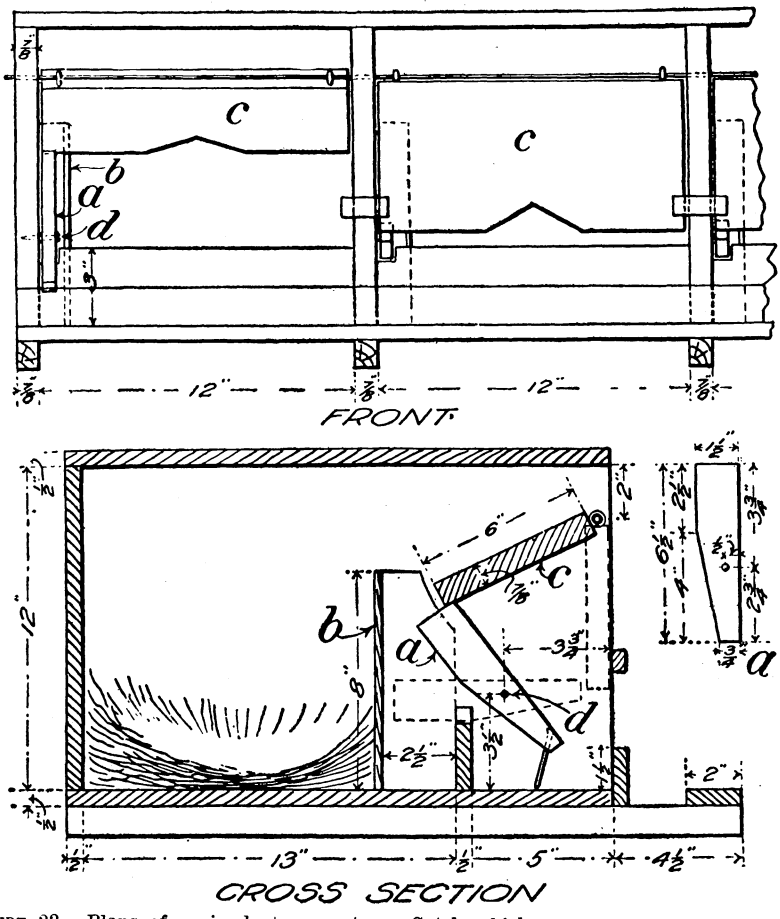

FIGURE 22.—Plans of a simple trap nest: *a*, Catch which supports and also locks the door; *b*, guard around the catch; *c*, door; *d*, pivot for catch.

The use of trap nests is essential in breeding poultry for both egg production and exhibition where pedigree records are used in selecting either the males or females. Trap nests are of value in weeding out poor layers and increasing the average egg yield of a flock by selecting and breeding, and used by many poultry breeders but by only a few poultrymen who keep hens for market eggs. The use of trap nests enables the poultryman to obtain more accurate records on the layers than can be done in any other way. Some poultry breeders trap-nest only their pullets at the beginning and at the

end of their laying year and use this as a basis in selecting their breeders for egg production.

One trap nest should be provided for every 4 hens kept in flocks of 50 or more, and 1 for about every 3 hens in smaller flocks. There are several styles of trap nests that give satisfaction. A plan of a trap nest is given in figure 22. This nest is shown in use in figure 23. Several manufacturers of trap nests sell the fronts separately, so that by purchasing them it is a very simple matter to make the nest and attach the trap to it.

DRY-MASH HOPPERS

Dry-mash hoppers should be so constructed as to avoid any wasting of the mash, and should keep litter and dirt out of the feed.

FIGURE 23.—A good dry-mash hopper for laying hens. Note also the drinking stand at the right and trap nests in the rear.

The hopper should be long enough to afford plenty of feeding space (fig. 19) for the hens; a hopper which allows the hens to eat from both sides should be from 1 to 1½ feet long for every 10 birds. A good indoor dry-mash hopper is shown in figures 23 and 24. A small section of this hopper may be used for shell and grit, or separate boxes or small hoppers may be provided for these feeds. A mash hopper with a much simpler supporting frame is shown in figure 19. The box of this feed hopper is 10 inches wide and 5 inches deep. It has laths nailed on the top edges of the box to prevent any wasting of the mash. Small open troughs (fig. 27) are used for feeding young chicks for the first 2 or 3 weeks. These may be replaced by larger waste-proof hoppers (fig. 23) set directly on the floor. Sufficient hopper space should be provided so that the chicks

may eat without crowding. Outdoor mash hoppers (figs. 25 and 26) are used for the chickens on range. These hoppers should

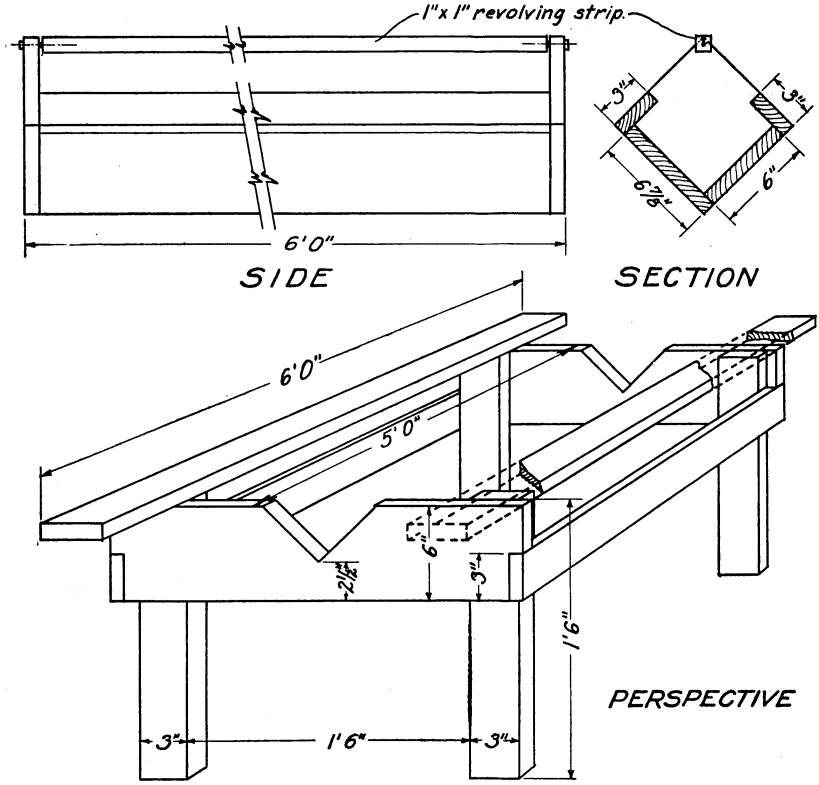

FIGURE 24.—Plan of dry-mash hopper shown in figure 23.

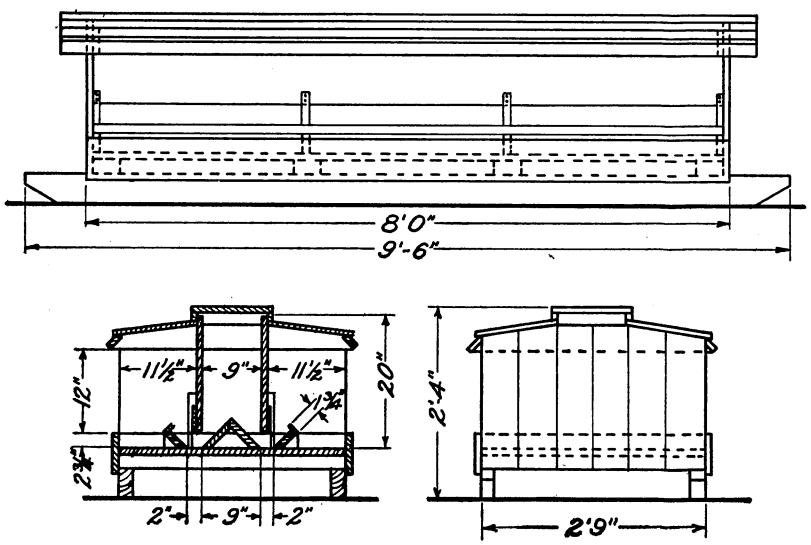

FIGURE 25.—Cross section of dry-mash hopper shown in figure 26.

be moved frequently, however, to promote sanitation and prevent rats from harboring in the ground beneath.

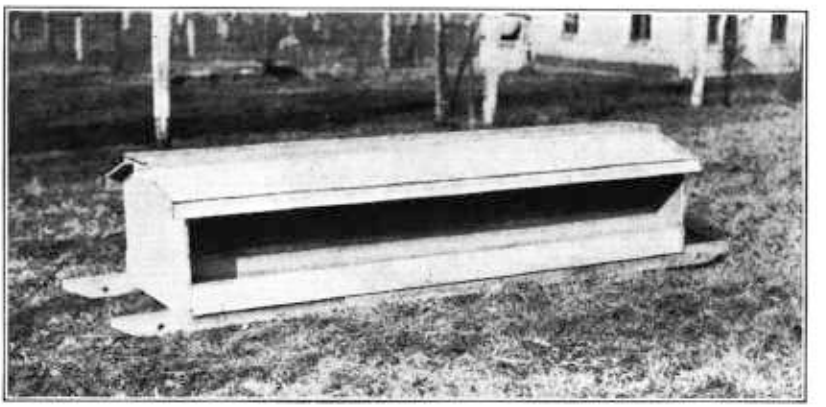

FIGURE 26.—An outdoor dry-mash hopper.

DRINKING STANDS

The drinking vessels for water should be supported on platforms about 12 to 18 inches off the floor. Such an arrangement tends to keep the drinking vessels and contents in a much more sanitary con-

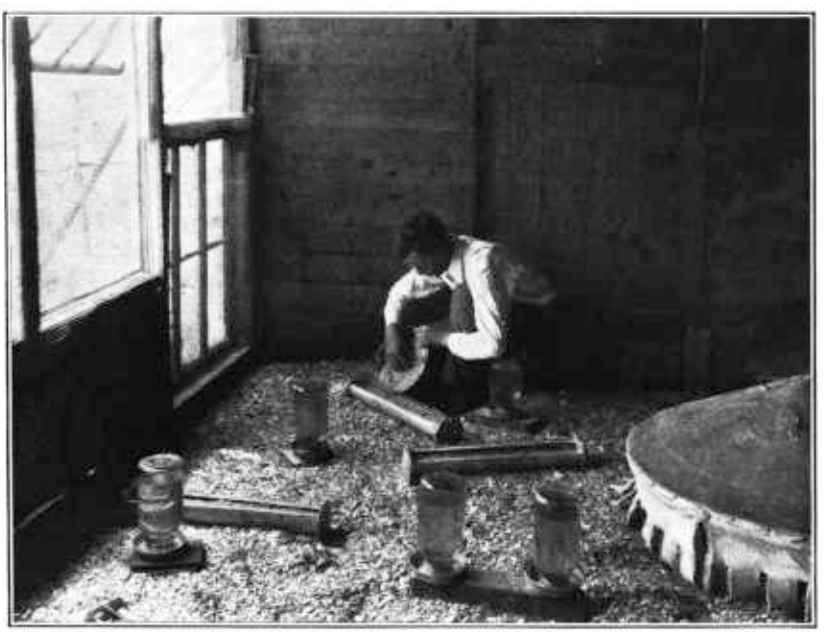

FIGURE 27.—Small feed troughs and water fountains used for young chicks in the brooder pen.

dition. The platform should be large enough for the birds to stand on comfortably while drinking, and it should be made of slats, so that droppings will not accumulate (fig. 23). Another good arrangement is to place the water fountain on a frame covered and enclosed

with wire mesh. This device keeps the hens out of the drippings and helps to keep the floor litter dry. Automatic watering troughs, heated or protected against freezing in winter, are often used in large laying houses to furnish the fowls with a continuous supply of fresh water. This arrangement is a great saver of labor; in fact, few poultrymen realize the amount of labor expended annually in watering a flock of chickens.

OAT SPROUTER

There are a number of devices on the market for sprouting or germinating oats, the simplest of which are usually the most satisfactory, as they require the least labor. One of the most satisfactory kinds of oat sprouter is a table about 2 feet high, 2 feet wide, and as long as may be desired, the bottom of the table being perforated with small holes, for drainage, and the sides being about 4 inches high (fig. 28). The quantity of oats required for a day's feeding is

FIGURE 28.—A very simple arrangement for sprouting oats. The oats are spread out on the table, which is perforated with half-inch holes, and turned daily with a shovel. The stove is used to maintain a temperature of about 70° F.

soaked in warm water in a sack for 24 hours and then emptied onto one end of the table where the oats are left in a pile and covered with sacks until germination is well started. The grain is then spread out about 2 or 3 inches thick on the table. Each day the oats are watered and turned over with a shovel until the roots become matted together. The table should be kept in a room where the temperature is about 70° F.

OTHER EQUIPMENT

A suitable place to "break-up" broody hens is necessary in a poultry plant. It may be a simple wire-covered coop, but it should be so arranged that the broody hens can be fed and watered regularly, and the bottom of the coop should be made of slats or heavy wire so that air will circulate freely beneath the hens. The broody coop

is usually placed over the nests, with a galvanized-iron tray for the droppings placed under the coop.

A similar type of coop is used in constructing fattening crates, except that the coops are usually arranged in batteries (fig. 29). The

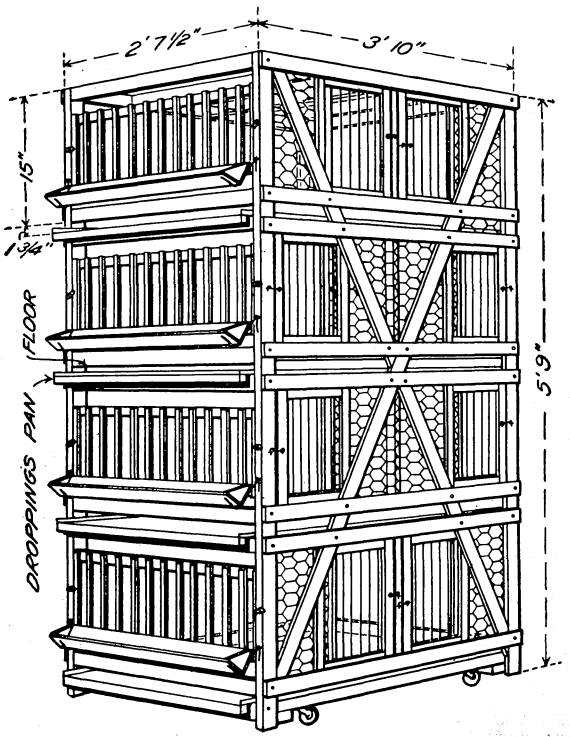

FIGURE 29.—Four-tier fattening battery with wire-mesh floors and galvanized droppings pan. One section of this would make a good broody coop.

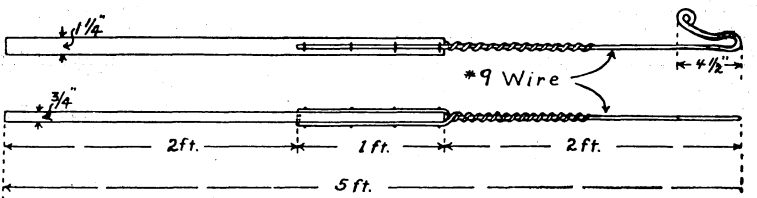

FIGURE 30.—Plan of catching hook. The wire is fastened to the outside of the wooden handle. In the lower view the hook lies flat and does not show.

slats in the front are placed 1⅞ inches apart so that the chickens can eat out of the 3-inch troughs attached to each coop. The battery is divided into 8 coops, 2 on each tier. Another type of fattening coop is the single-tier coop with small compartments in which each bird is kept by itself. Other useful articles of equipment are a catching hook (fig. 30), a crate for use in culling hens (fig. 11), and an incinerator for burning carcasses of diseased birds.

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